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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/679,985

10/06/2003

Dzhakhangir V. Khaydarov

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EXAMINER

VAN ROY, TOD THOMAS

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/679,985

Applicant(s)

KHAYDAROV, DZHAKHANGIR V.

Examiner

Tod T. Van Roy

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

The examiner acknowledges the addition of claims 25-26.

Response to Arguments

Applicant's arguments, see Remarks, filed 03/20/2006, with respect to claims 1-24 have been fully considered and are persuasive. The rejection of the claims has been withdrawn.

The examiner agrees that the use of the Jiang reference, which teaches away from Q-switching, is improper, and not obvious to combine with the other stated references.

The previous obvious type doubling patenting rejection is withdrawn, and a new rejection is written for clarity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 8-17, and 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Del Corno et al. (Active-passive mode-locked Nd:YAG laser with passive negative feedback, Optics Letters, Vol.15, No.13, July 1, 1990) in view of Il'ichev et al. (Model of a passively Q-switched laser accounting nonlinear absorption anisotropy in a passive switch, Proceedings of Nonlinear Optics: Materials, Fundamentals, and Applications Topical Meeting, 113-115 (1998)).

With respect to claims 1 and 5, Del Corno teaches a laser defining a cavity, the cavity housing a proximal reflective surface (fig.1 M2), a distal reflective surface (fig.1 M1), a beam pathway there between, and, along the beam pathway, a solid-state laser medium (fig.1 Nd:YAG), a source of pulsed energy for energizing the laser medium (col.2 para.2 flashlamps), means for providing an energy output from the cavity (fig.1 POL), and a beam limiting element (fig.1 $\lambda/4$, limiting beam output polarization), the laser comprising: a passive negative feedback (PNF) element (fig.1 NFE) arranged along the beam pathway; and a saturable absorber (SA) element arranged along the beam pathway (fig.1 DC) for Q-switching the laser. Del Corno does not teach the SA to have a recovery time longer than an output pulse, or the orientation of the SA to be variable and able to effect the pulse duration. Il'ichev teaches a laser system comprising Nd:YAG and a SA that has a long recovery time (approx. 3us) and whose orientation effects the pulse output duration (fig.3). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser and SA of Del Corno with

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the orientation dependent SA of Il'ichev in order to allow for control of the output pulse characteristics.

With respect to claims 2-3, Del Corno and Il'ichev teach the laser of claim 1, and Del Corno teaches pulses in the 10-30ps range (col.4 para.2), when in combination with the pulse variance of Il'ichev (fig.3) would allow for the obvious optimization of the claimed pulse duration ranges.

With respect to claim 4, Del Corno and Il'ichev teach the laser of claim 1, and Del Corno further teaches the output energy to be about 10uJ (col.4 para.2), but does not teach the output power to be about 100uJ to 2mJ. It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the output power to a higher level as this has been shown to be within the skill of a general worker in the art (see MPEP 2144.05 II A - "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

With respect to claim 6, Del Corno and Il'ichev teach the laser of claim 1, and Del Corno further teaches the SA element to be between the proximal reflective surface (fig.1 M2) and the means for outputting from the cavity (fig.1 POL).

With respect to claims 8-9, Del Corno and Il'ichev teach the laser of claim 1, wherein the orientation taught by Il'ichev comprises orientations between a first and second angle relative to a polarization of the beam in the beam pathway (fig.3d, approx. 0-45 degrees relative to the optical axis).

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With respect to claims 10-12, Del Corno and Il'ichev teach the laser of claim 1, wherein the usable SA orientation dependent mediums taught by Il'ichev are LiF:F2 and Cr4+:YAG (Il'ichev, para.3).

Claims 13 and 16 are rejected for the reasons stated in the rejection to claims 1 and 5.

Claims 14 and 24 are rejected for the reasons stated in the rejection to claims 2-3.

Claim 15 is rejected for the reasons stated in the rejection to claim 4.

Claim 17 is rejected for the reasons stated in the rejection to claim 6.

Claims 19-20 are rejected for the reasons stated in the rejection to claims 8-9.

Claims 21-23 are rejected for the reasons stated in the rejection to claims 10-12.

With respect to claims 25-26, Del Corno and Il'ichev teach the laser of claim 1, wherein it is inherent that the SA taught by Il'ichev is rotatably mounted (either rotatable while mounted, or rotated and then mounted) in the cavity, as more than 1 angle is taught to have been tested (Il'ichev, fig.3).

Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Del Corno and Il'ichev in view of Bartschke (Diode-pumped passively Q-switched self-frequency-doubling Nd:YAB laser, J. Opt. Soc. Am. B., Vol.14, No.12, Dec.1997).

With respect to claims 7 and 18, Del Corno and Il'ichev teach the laser outlined in the rejection to claim 1, but do not teach the SA to movable to a plurality of different locations between the proximal reflective surface and the output means. Bartschke

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teaches a Nd³⁺ active material Q-switched by a Cr⁴⁺:YAG device (fig.1), wherein it is taught that the placement of the SA relative to the active material can affect the output of the system (col.5 para.1). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser system of Del Corno and Il'ichev with the movable SA of Bartschke in order to optimize the system output, for instance, reducing spatial hole burning (Bartschke, col.5 para.1).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5, 10-13, 16, and 21-23 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 7, 9, 14, 40-44 of U.S. Patent No. 6546027 in view of Il'ichev.

Claims 1 and 40 of '027 teach the laser cavity and components of claims 1 and 13, but do not teach the SA to have a recovery time longer than an output pulse, or the orientation of the SA to be variable and able to effect the pulse duration. Il'ichev teaches a laser system comprising Nd:YAG and a SA that has a long recovery time (approx. 3us) and whose orientation effects the pulse output duration (fig.3). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser and SA of Del Corno with the orientation dependent SA of Il'ichev in order to allow for control of the output pulse characteristics.

Claims 5, 10-12, 16, and 21-23 are then rejected for being substantially the same as claims 3, 7, 9, 14, and 41-44 of '027.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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